



McCALL FISH HATCHERY

2000 Summer Chinook Salmon Brood Year Report

by

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**IDFG 02-37
September 2002**

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ABSTRACT

The South Fork Salmon River trapping season began on June 19, with the weir installation and opening of the trap. Trapping operations concluded on September 8, 2000.

Chinook salmon *Oncorhynchus tshawytscha* spawning at the trap commenced on August 15 and concluded on September 8, 2000. A total of 6,812 returning chinook salmon were trapped, measured, and recorded during this period. The overall average eye-up from eggs taken from the South Fork stock was 86.0%.

Of the 6,812 fish trapped: 1,771 were females, of which 690 were ponded; 200 were released above the weir. The pre-spawn mortality for females was 5.1%. There were 1,625 adult males trapped of which 221 were released above the weir. The pre-spawn mortality for the males was 6.5%. There were 3,416 jacks trapped (according to length frequency criteria). 699 were released and 12 were used for spawning. Due to the high numbers of jacks, 2,046 were given to the tribes or charitable organizations.

Of the females ponded, 361 South Fork stock were spawned with an average fecundity rate of 4,377 eggs per female, resulting in 1,580,053 green eggs taken. There were 16 Johnson Creek females held and spawned, resulting in 70,038 green eggs. There were 75 pair of reserve adult salmon transported and held for spawning at the Sawtooth hatchery for the Shoshone-Bannock tribal egg box program.

During March 2002, there were 1,064,250 Brood Year 2000 smolts weighing 46,332 pounds transported and released at Knox Bridge. Nez Perce tribal fishery personnel transported 57,932 Johnson Creek stock smolts to Johnson Creek for release.

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INTRODUCTION

McCall Fish Hatchery (MCFH) was built in 1979 as a result of the Water Resources Development Act enacted by Congress in 1976. A portion of this Act is the Lower Snake River Fish and Wildlife Compensation Plan (LSRCP). The LSRCP compensates Idaho for fish and wildlife losses caused by the Lower Snake River Projects (Ice Harbor, Lower Monumental, Little Goose, and Lower Granite dams). The MCFH was the first hatchery built as a partial fulfillment of the LSRCP. Funding for LSRCP is administered to the Idaho Department of Fish and Game (Department) by the US Fish and Wildlife Service (USFWS).

The MCFH is located within the city limits of McCall, Idaho along the North Fork of the Payette River, approximately 0.16 km (1/4 mile) downstream from Payette Lake.

A satellite facility for trapping and spawning adult chinook salmon *Oncorhynchus tshawytscha* is located on the South Fork Salmon River near Warm Lake, approximately 26 miles east of Cascade, Idaho.

The main production for MCFH is summer chinook reared to smolt size. There is also a resident trout program funded solely by the Department.

The first salmon reared at the MCFH were transferred in from the Mackay Fish Hatchery and the Dworshak/Kooskia National Fish Hatchery complex. These eggs were the products of adult summer chinook trapped at Little Goose and Lower Granite dams. The first eggs from the South Fork of the Salmon River were received in August 1980.

OBJECTIVES

The mitigation goal is to return 8,000 adult summer chinook salmon above Lower Granite Dam. The objectives of the MCFH are:

1. Restore summer chinook salmon to the South Fork Salmon River; historically a major summer chinook stream in Idaho.
2. Trap and spawn adult salmon returning to the South Fork Salmon River.
3. Raise 1,000,000 summer chinook smolts for release into the South Fork Salmon River.
4. Work with management and research to identify optimum operating procedures for the MCFH.

FISH REARING FACILITIES

The hatchery facility consists of six buildings on approximately 15 acres. The largest building consists of a shop, parking garage, incubation and early rearing area, generator room, and feed/freezer room. The office and a three-bedroom dormitory are contained in one building. There is a visitor center with restrooms, a flow chart for a self-guided tour, and historical information signs. There are three residences for permanent personnel also located on the site.

The fish production facilities include:

1. Twenty-six eight-tray stacks of FAL (Flex-A-Lite, Consolidated) vertical flow (Heath type) incubators.
2. Fourteen concrete vats 4-ft x 40-ft x 2-ft (water depth); 320 cubic feet of rearing area per vat.
3. Two concrete rearing ponds 196-ft x 40.5-ft x 4-ft (water depth); 23,814 cubic feet of rearing space per pond.
4. One concrete collection basin 101-ft x 15-ft x 4-ft (water depth). The hatchery is designed to raise a maximum capacity of 1,000,000 smolts, averaging 17 fish per pound (fpp).

An adult trapping and spawning facility is located on the South Fork of the Salmon River near Warm Lake. This facility is equipped with a removable weir, fish ladder, trap, two adult holding ponds (10-ft x 90-ft), and a covered spawning area. Water is supplied from the South Fork Salmon River through a 33-inch underground pipeline. Holding capacity for the facility is approximately 1,000 adult salmon. Some adults are passed above the weir to spawn naturally, with an additional group transported to Stolle Meadows for Idaho Supplementation research. Eggs collected at the facility are transported "green" to MCFH for incubation and rearing.

WATER SUPPLY

Hatchery water is obtained by gravity flow from Payette Lake through a 36-inch underground pipeline. Water may be taken from the surface or up to a depth of 50 ft, thus providing the capability of obtaining optimum rearing water temperatures.

Through an agreement with the Payette Lake Reservoir Company, 20 cubic feet per second (cfs) of water flow is available for hatchery use. Design criteria and production goals were established using this constraint, ensuring the hatchery has enough water to meet its production goals.

Water quality analysis reveals a somewhat "distilled" system for rearing fish (Appendix 12). The pH stays about 6.8. There is no indication of problems with heavy metals and temperature is maintained at 52°F to 56°F, with a low of 37°F.

STAFFING

The hatchery is staffed with three permanent employees: a Hatchery Manager II, an Assistant Hatchery Manager, and a Fish Culturist. In addition, there are four temporary employees to assist during the busy field season.

TRAPPING AND SPAWNING

The 2000 trapping season started on June 19, with the ponds set up, water turned on in the fish ladder, and weir installation. The first fish was trapped on June 20. Trapping continued through September 8, 2000. Normal trap installation is usually around June 20 with the fish arriving shortly thereafter. The peak of the run for 2000 was July 11.

There were 6,812 fish trapped; 1,771 (26%) were females, and 5,041 (74%) were males. A total of 3,416 male fish (67.7%) were jacks (three-year-old-fish) according to length frequency criteria. There were 200 females, 221 adult males, and 669 jacks released upstream of the weir.

Trap data obtained from the fish included fork length, sex, and mark type. All of the fish were also checked for internal and external tags.

The run was comprised of 6,093 marked (89.4%) and 719 (10.6%) unmarked fish. Several of the fish were tagged more than once. Eighteen of the supplementation fish were visual implant elastomer (VIE) tagged, (2) florescent orange, and (16) green. The tags proved somewhat difficult to locate. Close observation is required to identify this mark. Of the tags recovered or detected, 454 were PIT tags, 18 were visual implant elastomer tags (VIE), and 24 radio tags.

Of the 6,812 fish trapped, 353 snouts were removed from adipose fin-clipped (AD) fish indicating coded-wire tags (CWT). These were sent to the lab in Lewiston, Idaho for tag removal.

The age-class determination by length frequency was used at the trap site during initial trapping. The CWT recovery data and scale analysis show an overlap of age-classes originally determined using length frequency (Appendix 1).

Fork lengths were taken on all of the fish trapped, and all of the adult fish were injected with Erythromycin (Erythro 200) at a rate of 10 mg/kg.

Of the total number of fish released, 1,120 (221 males, 200 females, 699 jacks) were released above the weir, at the time of trapping. There were no fish held for later release. The percent release for unmarked males and females was 90.6% and 85.1% respectively. Due to the low number of supplementation fish that returned this year, adipose clipped males and females were also released upstream. This was done to improve the ratio of unmarked female (listed fish) releases upstream with supplementation female (listed fish). A 1:1 ratio was required by NMFS in the Department trapping permit. There were 2,353 reserve fish transported to a site near Goat Creek to be recycle through the fishery, of these, 641 were recaptured fish. There was 100 pair of reserve adults transported and released into the East

Fork of the South Fork near Stibnite. There was an additional 75 pairs of reserve adults taken to the Sawtooth hatchery to be held, spawned, and eggs given to the Shoshone-Bannock egg box program.

A total of 2,515 SFSR stock adults were held for hatchery production. Pre-spawn mortality for the females was 5.1%, with 6.5% for the males. There were 73 Johnson Creek adult salmon held at the South Fork trap this season. Spawn-taking activities started on August 15, and finished on September 8, 2000. Two females were culled on-site for gross clinical signs consistent with bacterial kidney disease. Nez Perce fisheries workers were present during several spawn days to collect sperm for cryogenics preservation. A total of 1,580,053 green eggs were taken from 361 females for an average fecundity rate of 4,377 eggs per female. There were 17 unmarked females, 6 right ventral clipped, 3 no-mark elastomer green fish spawned for supplementation research, 335 for reserve or production fish. The average eye-up rate was 86%. All eggs taken were water-hardened for one hour in a 200-ppm titrateable iodine solution prior to being transported to the hatchery. The fecundity rate is estimated at 4,500 eggs per female until the eye-up stage is reached and the eggs are enumerated. At eye-up, the eggs are shocked by siphon, picked with an electronic picker, and enumerated by displacement and an electronic counter. The overall eye-up totaled 1,149,313 eggs from the SFSR stock, 60,224 for the Johnson Creel stock. Spawning mortalities were returned to the river both above and below the weir for nutrient enhancement.

All of the spawned females were disease sampled by the pathologists from the Eagle Lab. The fish with ELISA values of 0.25 or greater were considered high positive for bacterial kidney disease (BKD). There was a total of 245,113 South Fork stock eggs culled out due to BKD.

Incubator flows were set at a five gallon per minute (gpm) rate, and incubators were loaded at 2 females per tray due to space concerns. The eggs were treated with 1,667 ppm of formalin for 15 minutes starting three days after fertilization and continuing on a daily basis until the eggs started to hatch.

Eggs eyed-up at approximately 600 thermal units (TU) and were then shocked, picked, and enumerated. Hatching began at approximately 925 TU.

FISH PRODUCTION

Early Rearing

Fry were sent out to the concrete vats approximately three days prior to initial feeding. Initial feeding begins between 1,750 and 1,775 TU. Flows for the vats are set at 80 gpm and are loaded at 30,000 to 55,000 fish per vat, depending on the number of fish on hand. The vats start at half-length and are extended to full length when the density index (DI) reaches 0.30 to 0.35, usually around mid-February.

Beginning growth rates are slow, only 0.003-inch to 0.004-inch per day, due to water temperatures of only 37°F to 39°F. The fry are started on BioDiet #2 and #3 feed and remain on #3 until they reach 700 fpp. BioDiet feed has been used successfully at MCFH, using modified feed rates. The conversion rates average 1.1:1 to 1.5:1 during the fry- rearing stage.

Fish are moved to the outside rearing ponds during mid-June and mid-July. They are adipose clipped, ventral clipped, coded wire tagged (CWT), and enumerated as they are moved to the ponds. There were 46,975 supplementation fish moved to the Stolle Meadows acclimation pond on August 2. By the end of August, there were 1,123,941 fish on station. Approximately 41,764 of these are supplementation fish and 57,848 are Johnson Creek stock for Nez Perce tribal releases in to Johnson Creek (Appendix 13).

FISH HEALTH

Diseases Encountered and Treatment

During this past year, there has not been an epizootic that warranted medicated feed treatment. Two prophylactic erythromycin medicated feed treatments were applied to both the South Fork and Johnson Creek fish under the Investigational New Animal Drug (INAD) 6013/4333 to limit losses to *Renibacterium salmoninarum*. Adult summer chinook salmon returning to the South Fork Trap were injected with erythromycin to reduce pre-spawning mortality. This is provided by a veterinary extra-label exemption. During pre-liberation sampling on both Johnson Creek and South Fork summer chinook, only *Renibacterium* was detected with ELISA at low optical densities. No other pathogens were detected utilizing standard sampling techniques at pre-liberation.

ORGANOSOMATIC INDEX.

Summary of Fish Autopsy (Appendix 14a. and b.)

Acute Losses

No acute nor chronic losses were experienced at McCall Hatchingery during this brood year.

Other Assessments

The chinook at this facility appeared to be healthy robust fish by all tested parameters. In the future, it will be wise not overcrowd this facility with conservation programs until water supply improvements are met, and proper facility renovations are constructed.

FISH MARKING

The fish marking crew was here in June and July and marked approximately 1.15 million fish. These fish receive Ad clips, CWT/Ad-clips, CWT only and Right Ventral (RV) clips.

The marking crew returned in February and Passive Integrated Transponder (PIT) tagged 55,503 fish. The breakdown of tagged released fish appears in Appendix 13.

FISH DISTRIBUTION

The brood year 2000 smolt hauling operation began on March 25 with the release of the reserve and supplementation fish, and concluded on the evening of the March 28. There were approximately twenty-eight loads of fish hauled in four days. The river conditions were clear and low at the time of release. All together there were 1,064,250 Brood Year 2000 smolts at 22.97 fish per pound totaling 46,332 pounds released (Appendix 8).

Nez Perce Tribal fishery personnel transported 57,932 smolts to Johnson Creek on March 18 –20, for release.

EXPERIMENTS

The supplementation research carried over to the Brood Year 2000 chinook. This project is designed in an attempt to generate more returning adults to natural spawning grounds. Supplementation smolts are the prodigy of unmarked adults. These fish were isolated within the hatchery until they could be differentially marked to ensure that genetic crossover with hatchery production fish would not occur. When these fish return as adults, a portion will be kept for spawning purposes to continue this program. There were 41,700 smolts released in the supplementation group that received a Right Ventral (RV) clip. These fish were released at the same time as the normal production group. There were 46,975 supplementation fish, (CWT only), released into the acclimation pond that was renovated near Stolle Meadows. These fish are to be volitionally released in the fall of 2001.

Low phosphate feed with a higher vitamin pack was utilized on the brood year 1999 fish with no adverse effects noted. This resulted in a reduction of total phosphorous in the hatchery effluent water to the minimum detectable amount (Appendix 11).

CONCLUSIONS

The brood year 2000 summer chinook released from MCFH were in excellent condition at release time. The culling program utilized on the BKD high-positive eggs had a positive effect on the over-all health and condition of the fish. The release pipe and tempering pump were utilized again this year. The fish transport and stocking went smoothly despite slick snowy roads and adverse weather conditions.

RECOMMENDATIONS

Low phosphate feed with a higher vitamin pack was utilized during the peak rearing cycle with no adverse effects noted. It is recommended to continue to utilizing low phosphate feed. All of the chinook eggs that tested high-positive for BKD were culled this year and this should be continued as egg numbers will allow. The gabion baskets need to be replaced to make a stable footing for the weir as the existing ones have rotted out over time. The entire asphalt driveway for the hatchery is in need of extensive repair or replacement.

APPENDICES

Appendix 1. Age distribution of 2000 summer chinook returns to McCall Fish Hatchery, South Fork Salmon River based on CWT and length frequency data.

Age	Males		Females	
	CWT* Estimate	Length/ frequency Estimate	CWT Estimate	Length/ frequency Estimate
3	2,915	3,416	0	0
4	2,097	1,582	1,747	1,724
5	29	43	24	47
Totals	5,041	5,041	1,771	1,771

*CWT data based on recovered from 353 snouts.
Length data is taken at trapping prior to first sort

Age-class breakdown

66 cm = three-year-olds, jacks
67-89 cm = four-year-olds
90 cm = five-year-olds

Appendix 2. Lengths of Brood Year 2000 fish trapped at McCall Fish Hatchery.

Fork Length (cm)	Males	Females
37	1	0
38	1	0
39	4	0
40	9	0
41	12	0
42	17	0
43	16	0
44	31	0
45	27	0
46	59	0
47	72	0
48	113	0
49	164	0
50	187	0
51	207	0
52	254	0
53	305	0
54	263	0
55	258	0
56	283	0
57	271	0
58	227	0
59	176	0
60	155	0
61	92	0
62	70	0
63	51	0
64	42	0
65	35	0
66	14	0
67	17	1
68	27	3
69	18	1
70	25	6
71	30	9
72	44	11
73	82	24
74	116	48
75	150	69
76	182	89
77	286	160
78	326	182
79	354	229
80	389	227
81	331	195
82	277	151
83	199	115

Appendix 2. continued

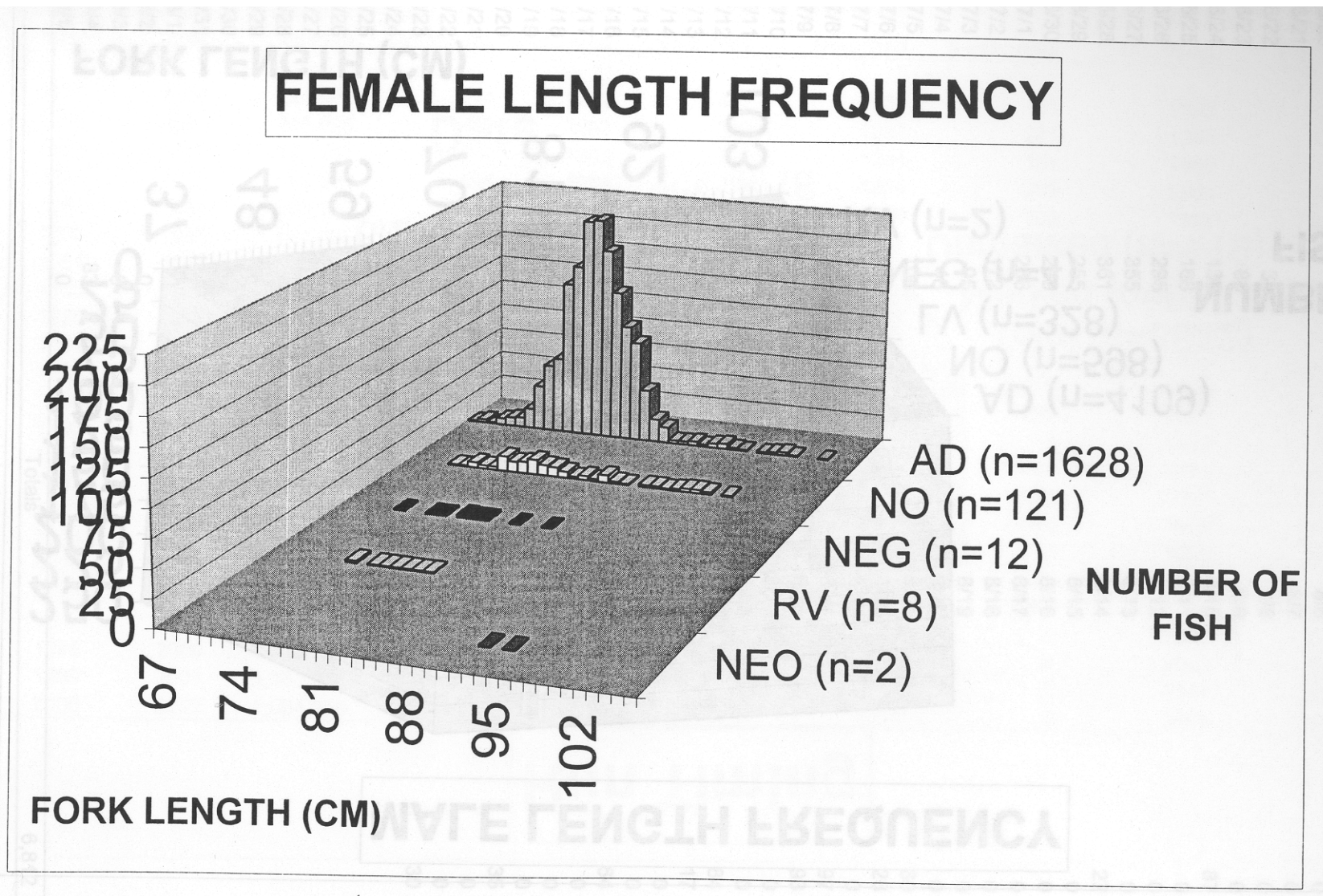
Fork Length (cm)	Males	Females
84	196	101
85	112	52
86	64	30
87	43	17
88	21	4
89	17	3
90	15	6
91	8	4
92	8	6
93	10	7
94	10	6
95	6	4
96	5	2
97	4	1
98	4	3
99	4	3
100	3	1
101	3	0
102	1	0
103	3	1
104	3	0
105	2	0
106	0	0
107	0	0
108	0	0
109	1	0
Totals	6812	1771

Appendix 3. Length frequency for Brood Year 2000 summer chinook broodstock at the South Fork of the Salmon River Trap, according to mark type recorded at McCall Fish Hatchery

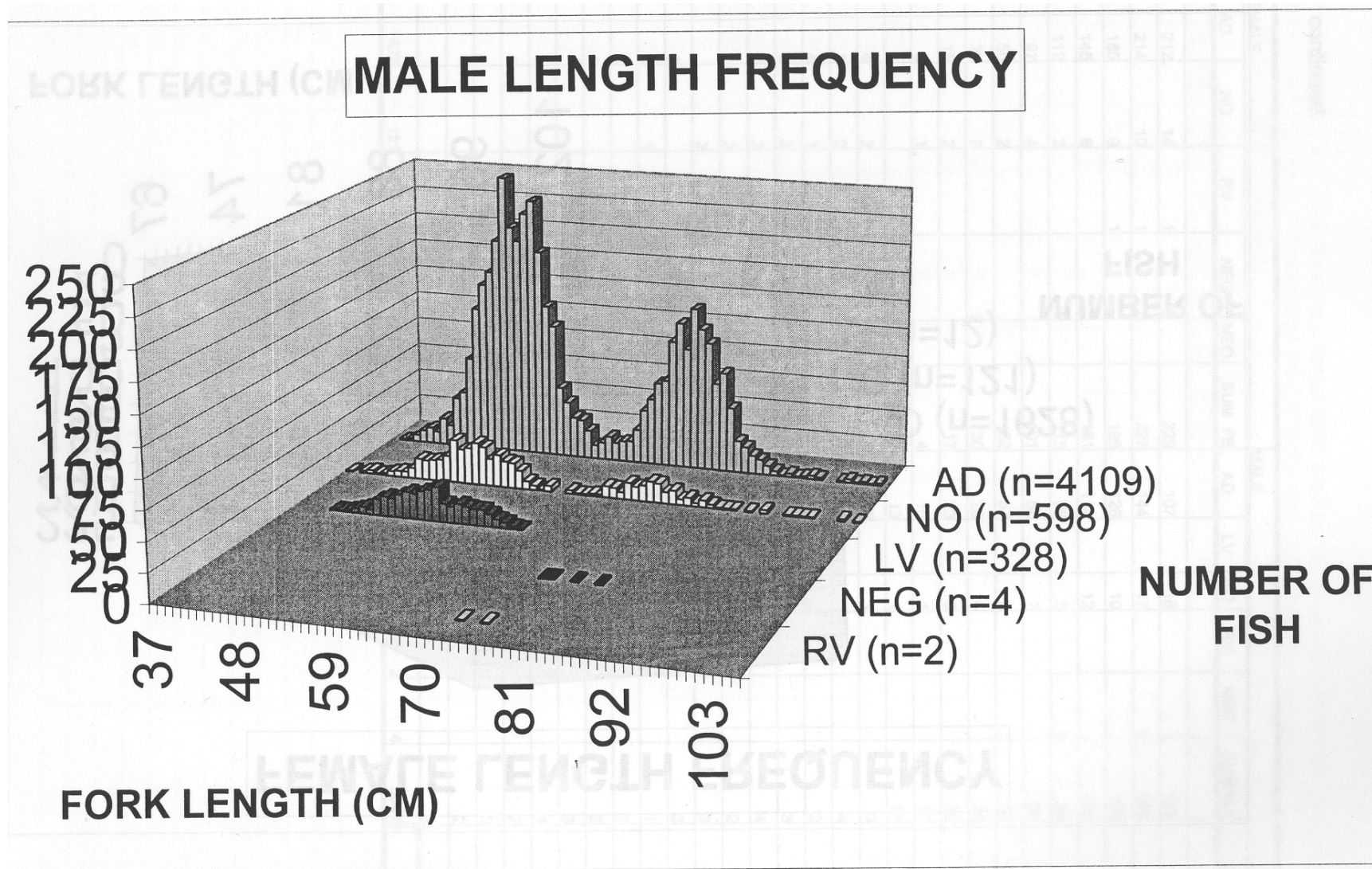
Fork Length (cm)	FEMALE						MALE						TOTAL
	AD	NO	RV	NEG	NEO	SUM FE	AD	LV	NO	RV	NEG	SUM MA	
37									1			1	1
38							1					1	1
39							2		2			4	4
40							6		3			9	9
41							11		1			12	12
42							14	1	2			17	17
43							11	1	4			16	16
44							24	2	5			31	31
45							18	4	5			27	27
46							44	6	9			59	59
47							50	4	18			72	72
48							82	14	17			113	113
49							129	17	18			164	164
50							152	16	19			187	187
51							164	20	23			207	207
52							193	23	38			254	254
53							253	22	30			305	305
54							206	25	32			263	263
55							194	27	37			258	258
56							219	30	34			283	283
57							231	16	24			271	271
58							185	14	28			227	227
59							136	17	23			176	176
60							118	15	22			155	155
61							62	14	16			92	92
62							49	14	7			70	70
63							36	11	4			51	51
64							34	7	1			42	42
65							25	5	5			35	35
66							12	2				14	14
67	1					1	15	1				16	17
68	3					3	21		3			24	27
69	1					1	16		1			17	18
70	6					6	18		1			19	25
71	8	1				9	19		2			21	30
72	9	1		1		11	30		2	1		33	44
73	19	5				24	48		10			58	82
74	43	3	2			48	59		9			68	116
75	65	3		1		69	74		6	1		81	150
76	73	14	1	1		89	77		15		1	93	182
77	149	10	1			160	113		12		1	126	286
78	167	11	1	3		182	130		14			144	326

Fork	FEMALE						MALE							
Length (cm)	AD	NO	RV	NEG	NEO	SUM FE	AD	LV	NO	RV	NEG	SUM MA	TOTAL	
79	212	14	1	2		229	107		18			125	354	
80	214	10	1	2		227	144		17		1	162	389	
81	185	9	1			195	126		10			136	331	
82	145	6				151	114		12			126	277	
83	112	2		1		115	78		5		1	84	199	
84	97	4				101	88		7			95	196	
85	50	2				52	57		3			60	112	
86	22	7		1		30	28		6			34	64	
87	15	2				17	23		3			26	43	
88	3	1				4	16		1			17	21	
89	3					3	13		1			14	17	
90	4	2				6	8		1			9	15	
91	2	2				4	4					4	8	
92	4	1			1	6	1		1			2	8	
93	5	2				7	3					3	10	
94	2	3			1	6	1		3			4	10	
95	1	3				4	2					2	6	
96		2				2	3					3	5	
97	1					1	2		1			3	4	
98	2	1				3			1			1	4	
99	3					3			1			1	4	
100	1					1	1		1			2	3	
101							3					3	3	
102							1					1	1	
103	1					1	2					2	3	
104							1		2			3	3	
105							2					2	2	
109									1			1	1	
TOTAL	1628	121	8	12	2	1771	4109	328	598	2	4	5041	6812	

Appendix 4a. South Fork Salmon River summer chinook female length frequency graph BY00



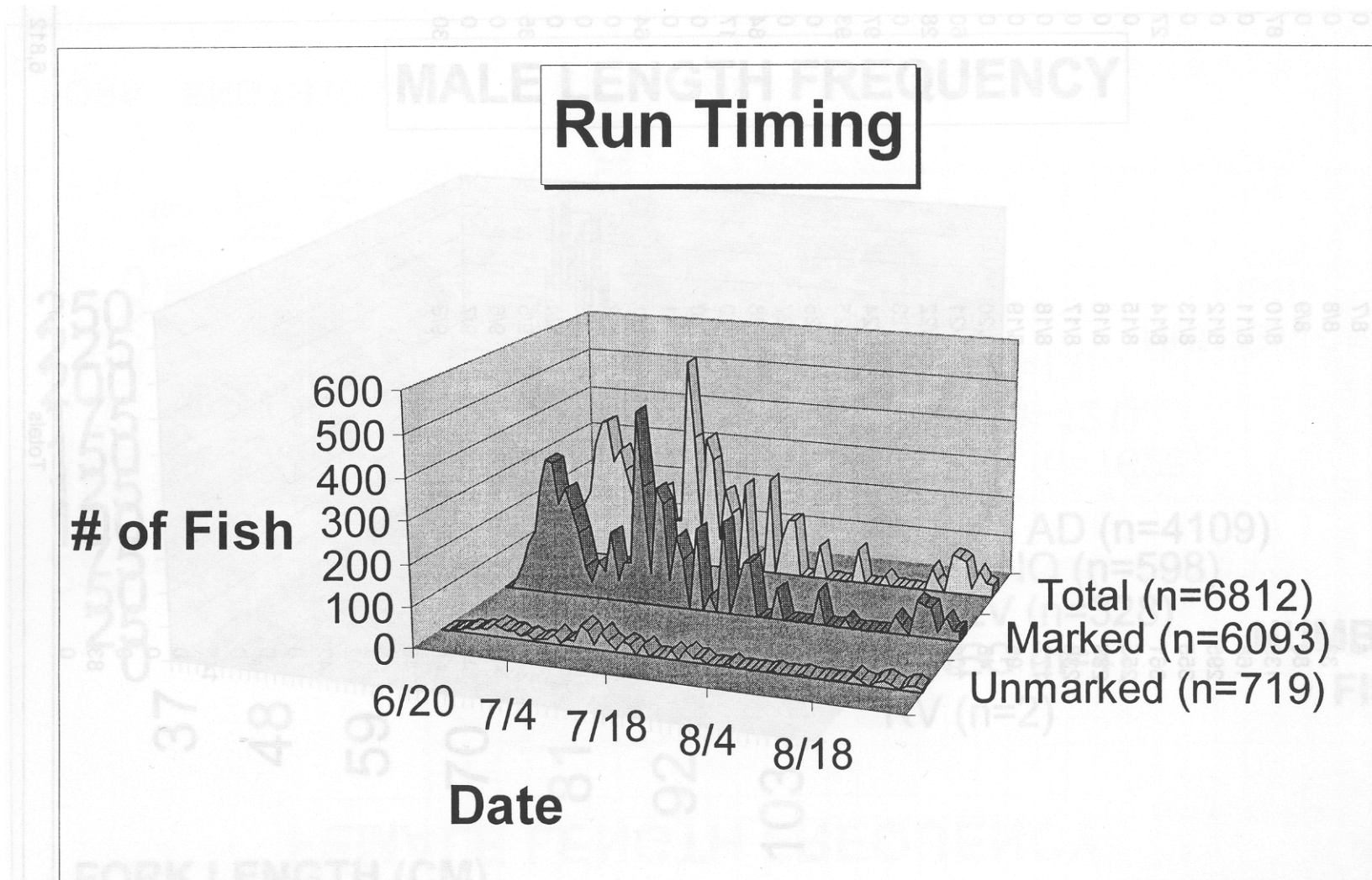
Appendix 4b. South Fork Salmon river summer chinook male length frequency graph BY00



Appendix 5. McCall Fish Hatchery 2000 Summer chinook run timing, South Fork Salmon River.

Date	Number Trapped	Date	Number Trapped
6/20	3	8/6	0
6/21	6	8/7	0
6/22	33	8/8	0
6/23	80	8/9	0
6/24	139	8/10	87
6/25	168	8/11	0
6/26	295	8/12	0
6/27	355	8/13	0
6/28	361	8/14	27
6/29	255	8/15	0
6/30	289	8/16	0
7/1	238	8/17	0
7/2	172	8/18	0
7/3	95	8/19	0
7/4	48	8/20	0
7/5	104	8/21	60
7/6	79	8/22	28
7/7	196	8/23	0
7/8	61	8/24	97
7/9	113	8/25	93
7/10	116	8/26	0
7/11	530	8/27	0
7/12	336	8/28	84
7/13	91	8/29	17
7/14	337	8/30	0
7/15	282	8/31	0
7/16	77	9/1	64
7/17	205	9/2	0
7/18	147	9/3	0
7/19	0	9/4	0
7/20	227	9/5	35
7/21	0	9/6	0
7/22	44	9/7	0
7/23	0	9/8	30
7/24	246		
7/25	0		
7/26	92		
7/27	142		
7/28	0		
7/29	0		
7/30	0		
7/31	145		
8/1	0		
8/2	0		
8/3	0		
8/4	83		
8/5	0		
Totals		6,812	

Appendix 6. Mccall Fish Hatchery South Fork Salmon River chinook run timing graph BY00



Appendix 7. Historic hatchery releases and returns logged at McCall Fish Hatchery

Brood Year	Release Year	Number of Fish	3-year-olds	Year Returned	4-year-olds	Year Returned	5-year-olds	Year Returned	Percent Returned
1978	1980	124,800	124	1981	462	1982	161	1983	0.598
1979	1981	248,926	48	1982	272	1983	221	1984	0.217
1980	1982	122,247	504	1983	713	1984	151	1985	1.119
1981	1983	183,896	595	1984	1,259	1985	203	1986	1.119
1982	1984	269,880	828	1985	1,265	1986	202	1987	0.850
1983	1985	564,405	1,222	1986	2,117	1987	893	1988	0.674
1984	1986	970,348	386	1987	1,392	1988	191	1989	0.255
1985	1987	958,300	50	1988	252	1989	30	1990	0.035
1986	1988	1,060,400	495	1989	911	1990	154	1991	0.147
1987	1989	975,000	28	1990	237	1991	25	1992	0.029
1988	1990	1,032,500	821	1991	2,617	1992	1,311	1993	0.030
1989	1991	708,600	206	1992	1,364	1993	299	1994	0.263
1990	1992	901,500	28	1993	158	1994	5	1995	0.021
1991	1993	607,298	70	1994	201	1995	37	1996	0.050
1992	1994	1,060,163	101	1995	424	1996	166	1997	0.065
1993	1995	1,074,598	738	1996	3,448	1997	555	1998	0.441
1994	1996	585,654	45	1997	343	1998	817	1999	0.206
1995	1997	238,367	76	1998	42	1999	90	2000	0.087
1996	1998	393,872	115	1999	3,306	2000	263	2001	0.935
1997	1999	1,182,615	3,416	2000	9,565	2001	0	2002	0.000
1998	2000	1,039,930	1,094	2001	0	2002	0	2003	0.000
1999	2001	1,165,231	0	2002	0	2003	0	2004	0.000
2000	2002	1,064,250	0	2003	0	2004	0	2005	0.000

Appendix 8. Summer chinook distribution in the South Fork of the Salmon River from
McCall Fish Hatchery

Destination	Weight	Number/pound	Number released
Knox Bridge	12,725	22.97	292,294
Knox Bridge	13,100	22.97	300,909
Knox Bridge	12,900	22.97	296,314
Knox Bridge	7,607	22.97	174,733
Total Released	46,332		1,064,250

Appendix 9. Brood Year 2000 summer chinook survival from green eggs to released smolts

Number of Green Eggs	Number of Eyed Eggs	Percent Survival	Ponded	Percent Survival	Released Smolts	Percent Survival
1,580,053	1,149,313	86.00%	1,113,260	83.40%	1,064,250	79.70%

*Totals do no include culled eggs from green egg total,
and par to Stolle Pond.

Appendix 10. Temperature range from August 2000 to April 2002 at McCall Fish Hatchery

Date	Temperature
Aug-00	51.0
Sep-00	37.5
Oct-00	46.7
Nov-00	43.6
Dec-00	39.5
Jan-01	38.0
Feb-01	38.0
Mar-01	38.5
Apr-01	39.0
May-01	44.8
Jun-01	52.0
Jul-01	51.2
Aug-01	50.7
Sep-01	48.2
Oct-01	45.5
Nov-01	44.5
Dec-01	38.5
Jan-02	37.5
Feb-02	38.0
Mar-02	38.0
Apr-02	38.0

Appendix 11. Water analysis at McCall Fish Hatchery

Date	pH	Ammonia	Nitrate	Nitrite	Total Phosphate	Total Nitrogen	KJEL Hardness	CaCO ₂ Saturation	Oxygen ppm
1988	6.8	-	-	-	-	-	<10	97/103	7/10
1991		<0.05	<0.1	<0.1	<0.05	<0.10			
1993	6.9	<0.05	<0.1	<0.01	<0.05	<0.10			
1994	6.9	<0.05	<0.1	<0.01	0.01	<0.10			

Appendix 12. Brood Year 2000 production cost table.

Number of Fish	Pounds of Feed	Cost of Feed	Pounds of Fish	Conversion	Total Cost	Cost/ 1,000	Cost/ Pound
1,111,225	55,596.00	\$75,902	46,853	1.2	\$411,447	\$370.26	\$8.78

Includes the Stolle Pond fish.

Appendix 13. Brood Year 2000 marked fish released.

Date	Number of Marks Applied	Mark	Purpose	Number Marked Fish Released	Site/group Released
6/11-6/14/01	625,938	AD	Identification	622,890	1,064,250
7/16-7/23/01	345,547	AD/CWT	US-Canada	344,800	1,064,250
2/19-3/01/02	54,903	AD/PIT	Migration	54,860	1,064,250
7/16-7/23/01	41,834	RV	Supplementation	41,100	1,064,250
3/1/2002	600	RV/PIT	Supplementation	600	1,064,250
7/16-7/18/01	46,981	CWT	Supplementation	46,975	46,975
Total	1,115,803			1,111,225	1,111,225

Appendix 14a. Summary of fish autopsy

SUMMARY OF FISH AUTOPSY			
ACCESSION NO:	02-065	LOCATION:	McCall Hatchery
SPECIES:	Chinook Summer	AUTOPSY DATE:	3/7/2002
STRAIN:	SF SU	AGE:	Juv
UNIT:	All ponds sampled	SAMPLE SIZE:	20
REASON FOR AUTOPSY:	prelib		
INVESTIGATOR(S):	Munson		
REMARKS:			

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
LENGTH	0.00	0.00	0.00
WEIGHT	0.00	0.00	0.00
KTL*	0.00	0.00	0.00
CTL*	0.00	0.00	0.00
HEMATOCRIT	47.5	3.44	0.072
LEUCOCRIT	0.00	0.00	0.00
SERUM PROTEIN	9.2	1.02	0.11

*EXPRESSED AT KTL TIMES 10 TO THE FIFTH POWER

**CONVERTED FROM KTL; EXPRESSED AS CTL TIMES 10 TO FOURTH POWER

EYES		GILLS		PSEUDO-BRANCHS		THYMUS		MESEN. FAT		SPLEEN		GUT		HIND KIDNEY		LIVER		BILE	
N	20	N	20	N	20	0	20	0	0	B	0	0	20	N	20	A	0	0	0
B1	0	F	0	S	0	1	0	1	2	R	20	1	0	S	0	B	5	1	0
B2	0	C	0	L	0	2	0	2	1	G	0	2	0	M	0	C	15	2	0
E1	0	M	0	S&L	0			3	18	NO	0			G	0	D	0	3	0
E2	0	P	0	I	0	Mean=0.00		4	1	E	0	Mean=0.00		U	0	E	0		
H1	0	OT	0	OT	0					OT	0			T	0	F	0	Mean=0.00	
H2	0			O	0			Mean=3.0								OT	0		
M1	0																		
OT	0																		

SUMMARY OF NORMALS									
	20	20		20		20		20	20
SEX		M: 0				F: 0		U: 0	

GENERAL REMARKS:	
FINS: GOOD	GONADS:
SKIN: LOSING SCALES	OTHER:

Appendix 14b. Summary of fish autopsy

SUMMARY OF FISH AUTOPSY			
ACCESSION NO:	02-066	LOCATION:	McCall Hatchery
SPECIES:	Chinook Summer	AUTOPSY DATE:	3/5/2002
STRAIN:	JCF SU	AGE:	Juv
UNIT:	Catch basin sampled	SAMPLE SIZE:	20
REASON FOR AUTOPSY:	prelib		
INVESTIGATOR(S):	Munson		
REMARKS:			

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
LENGTH	0.00	0.00	0.00
WEIGHT	0.00	0.00	0.00
KTL*	0.00	0.00	0.00
CTL*	0.00	0.00	0.00
HEMATOCRIT	47.15	2.99	0.064
LEUCOCRIT	0.00	0.00	0.00
SERUM PROTEIN	9.2	0.99	0.11

*EXPRESSED AT KTL TIMES 10 TO THE FIFTH POWER

**CONVERTED FROM KTL; EXPRESSED AS CTL TIMES 10 TO FOURTH POWER

EYES	GILLS	PSEUDO- BRANCHS	THYMUS	MESEN. FAT	SPLEEN	GUT	HIND KIDNEY	LIVER	BILE
N 19	N 20	N 20	0 20	0 0 B	0	0 20	N 20	A 7	0 0
B1 0	F 0	S 0	1 0	1 0 R	20	1 0	S 0	B 12	1 0
B2 0	C 0	L 0	2 0	2 7 G	0	2 0	M 0	C 1	2 0
E1 0	M 0	S&L 0		3 11 NO	0		G 0	D 0	3 0
E2 0	P 0	I 0	Mean=0.00	4 2 E	0	Mean=0.00	U 0	E 0	
H1 1	OT 0	OT 0		OT	0		T 0	F 0	Mean=0.00
H2 0		O 0		Mean=2.75				OT 0	
M1 0									
OT 0									

SUMMARY OF NORMALS									
20	20	20	20	20	20	20	20	20	20
SEX	M: 0		F: 0		U: 0				

GENERAL REMARKS:	
FINS: GOOD	GONADS:
SKIN: LOSING SCALES	OTHER:

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